

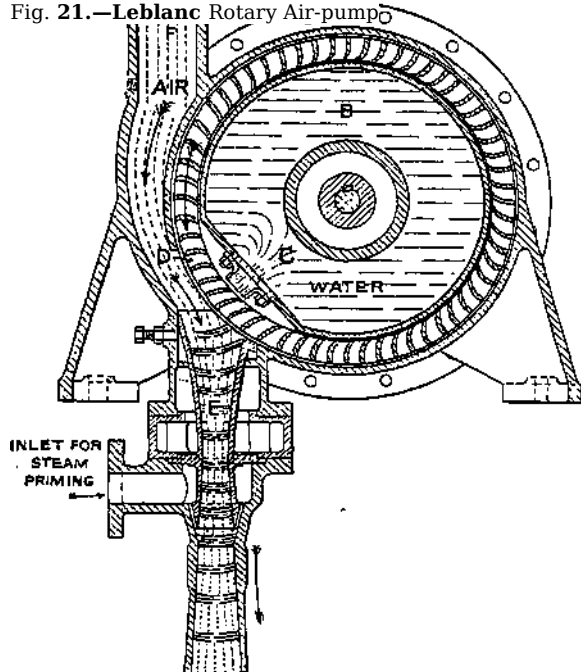
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condenser vacuum at normal loads, but with an abnormal leakage of air, increasing the effective air-pump capacity has a decided influence on the vacuum.

In the case of jet condensers the wet air-pump requires a sufficient displacement to discharge the injection water and water of condensation as well as the air.

Rotary Air-pumps.—Many attempts have been made to produce a rotary air-pump, but probably the most successful type is the modern Leblanc air-pump. It is essentially a high-vacuum pump, and its principal

Fig. 21.—Leblanc Rotary Air-pump



characteristic is the water ejector, in which the necessary kinetic energy of the water is produced by means of a reversed turbine of partial injection.

Fig. 21 shows a section through the Leblanc pump in the form

now usually adopted, and operates in the following manner. Sealing-water is introduced from a tank through a suitable branch to the central chamber B, from which it passes through the water guide nozzle C. Leaving this nozzle with a comparatively low velocity, the water enters the blades D of the impeller, and is ejected into the cone E more or less in the form of thin sheets which travel with a velocity of something like 130 ft. per second. When these sheets meet the sides of the cone they form water pistons with entrapped air coming from the condenser, and the momentum is sufficient to discharge the air

and water into the water-tank at a pressure slightly above that of the atmosphere, the air being liberated to the atmosphere, and the water, after cooling, allowed to return on its circuit through the pump. In the illustration the sheets of water are shown unbroken even in the discharging cone. It is hardly likely, however, that the water and air preserve these relations in the discharging cone; probably they get completely mixed up as the pressure rises towards the discharge end. The pump is conveniently driven by an electric motor or a small steam turbine directly connected.

A large number of these air-pumps are now at work in power-stations. Their main advantage lies in the fewness of the working parts and their